IN THE CLAIMS

Please amend the claims as set out in the following listing of the claims. This listing replaces and supersedes all prior claim listings.

1. (Currently Amended) A method of processing a data signal, comprising the steps of:

acquiring a data signal by an acquisition unit of a test instrument for a predetermined time;

storing said data signal in a memory of said test instrument;

recovering a clock signal from said stored data signal by

defining a threshold level relative to said stored data signal;

comparing each portion of the stored data signal to said threshold level;

determining pairs of adjacent samples that straddle said threshold;

estimating a time of crossing said threshold between said adjacent samples; and

considering a hysteresis requirement to confirm that a determined pair of adjacent samples that straddle said threshold should be included as part of a series of observed times of threshold crossing; and

slicing said stored data signal into a plurality of data segments of a predetermined length in accordance with said recovered clock signal.

2. (Canceled)

3. (Currently Amended) The method of processing a data signal of claim [[2]] 1, wherein said threshold is defined as an absolute value.

4. (Currently Amended) The method of processing a data signal of claim [[2]] 1, wherein said threshold is defined as a percentage of said recorded data signal's amplitude.

5. (Canceled)

6. (Currently Amended) The method of processing a data signal of claim [[2]] 1, wherein each said time of crossing of said threshold is estimated based upon a linear interpolation.

7. (Currently Amended) The method of processing a data signal of claim [[2]] 1, wherein each said time of crossing of said threshold is estimated based upon a non-linear interpolation.

8. (Currently Amended) The method of processing a data signal of claim [[2]] 1, wherein said series of observed times of threshold crossing is used to obtain a recovered virtual periodic clock.

9. (Original) The method of processing of claim 8, said clock recovery step further comprising the steps of:

comparing said series of observed times of threshold crossing to an ideal periodic sequence of expected times of threshold crossing comprising said recovered virtual periodic clock;

determining an error between said observed times and said expected times; and

adjusting the phase of said recovered virtual periodic clock in accordance with said determined error.

10. (Original) The method of processing of claim 8, said clock recovery step further comprising the steps of:

comparing each element of said series of observed times of threshold crossing to each element of an ideal substantially periodic sequence of expected times of threshold crossing;

determining the error between each observed time and the corresponding expected time, and;

based upon each error and preceding errors, adjusting the instantaneous phase of the substantially periodic sequence of times of threshold crossing according to mathematical

algorithms thus obtaining a specified dynamic response for the recovered substantially periodic clock.

11. (Original) The method of processing said data signal of claim 8, further comprising the steps of:

determining the absence of one or more transitions of said data signal;

locating a position of a next transition of said data signal;

associating said located next transition of said data signal with a closest expected time of threshold crossing of said recovered virtual periodic clock.

12. (Original) The method of processing said data signal of claim 8, further comprising the step of determining a number of expected times of threshold crossing that have passed between two transitions of said data signal between which an absence of one or more transitions has been determined.

13. (Original) The method of processing said data signal of claim 8, wherein said expected transition times are determined in accordance with calculations employing floating point numbers.

14. (Original) The method of processing a data signal of claim 1, wherein the step of recovering said clock signal further comprises the steps of:

estimating a frequency of said recovered clock; and

discarding a predetermined number of predicted times of threshold crossings of said data segments until said recovered clock settles to a substantially periodic frequency.

15. (Original) The method of processing a data signal of claim 1, wherein said step of recovering said clock signal further comprises the steps of:

detecting a predetermined number of transitions of threshold crossings of said data segments;

revising an initial phase of said recovered clock signal to give a mean time-error of zero for said predetermined number of transitions; and

restarting processing.

16. (Original) The method of processing a data signal of claim 15, wherein said recovered clock signal is made substantially perfectly periodic.

17. (Currently Amended) A method for displaying an eye diagram, comprising the steps of:

acquiring a data signal by an acquisition unit of a test instrument for a predetermined time;

storing said data signal in a memory of said test instrument;

recovering a clock signal from said stored data signal by

defining a threshold level relative to said stored data signal;

comparing each portion of the stored data signal to said threshold level;

determining pairs of adjacent samples that straddle said threshold;

estimating a time of crossing said threshold between said adjacent samples; and

considering a hysteresis requirement to confirm that a determined pair of adjacent samples that straddle said threshold should be included as part of a series of observed times of threshold crossing;

slicing said stored data signal into a plurality of data segments of a predetermined length in accordance with said recovered clock signal; and

overlaying said plurality of data segments on a display in a time synchronized manner.

18. (Original) The method of displaying an eye diagram of claim 17, further comprising the step of repeating said steps to acquire and display a second acquired data signal along with said first-mentioned data signal.

19. (Original) The method for displaying an eye diagram of claim 18, wherein said first and second data signal acquisitions are displayed after inter symbol interference processing.

20. (Original) The method for displaying an eye diagram of claim 18, wherein said first and second data signal acquisitions are displayed after the data segments associated therewith are mathematically processed.

21-26 (Canceled)